Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ADEQUATE SUPPORT OF HIGHER EDUCATION FROM THE STANDPOINT OF THE STATE[1]

R. M. HUGHES
Miami University

This question is so broad and has so many possible developments and bearings that it is impossible to attempt to discuss it fully in one paper.

The question perhaps splits naturally into three general divisions.

1. Regular instruction of students resident at state institutions.
2. Extension teaching.
3. Expert advice and guidance of all or part of the activities of the state by a staff of trained men employed by the university.

I shall discuss only the first of these three divisions, as the two latter may vary through such extremely wide latitudes that it would seem unprofitable for me to try to discuss them in a general way.

Public higher education in the United States has defined itself with sufficient definiteness to make it possible to discuss it with some confidence. At the same time there are many points on which there will probably be a wide difference of opinion. The aim of this paper will be to raise several questions as to what our standards should be in our universities and normal schools and what expenditure should be necessary adequately to maintain a state system of higher education.

The unprecedented growth of the great state universities within the last few years has threatened largely to cripple their usefulness. It is impossible to provide adequate instruction for freshman and sophomore classes that are growing by hundreds or thousands a year. There should be some stability in the junior college part of the state university, while any reasonable growth in the senior college, graduate, and professional schools should be encouraged.

---

[1] Address delivered before the North Central Association of Colleges and Secondary Schools, March 19, 1920, at Chicago, Illinois.

STATE JUNIOR COLLEGES

This condition could be secured by establishing a few state-supported junior colleges in each state. Each should provide for from 500 to 1,200 students, and each should be so articulated with the state university that students applying for admission to the state university, after her quota of junior-college students has been accepted, can be registered by the university authorities in one or another of the state junior colleges. This last condition seems to me to be essential to the value of the state junior college. The majority of boys and girls entering college will prefer to go to the biggest institution, particularly those who go for their own idle pleasure and social advantage. To serve its purpose properly the university must be able without question to place its surplus Freshmen and Sophomores in one or another junior college.

On the other hand, it is not practical to maintain a university without freshman and sophomore classes. A certain amount of junior-college instruction can be given without disadvantage, and a junior college in the university makes it possible for the professors in various professional and graduate departments as well as those in the senior college to control the curricula and instruction in the junior college, and through the standards thus set to control in a considerable degree the standards in freshman and sophomore instruction throughout the state.

One other reason for a sharp distinction between the junior and senior-college work in the state university, and for the establishment of separate state junior colleges, lies in the fact that with our democratic ideals a great many students enter college who have neither the ability nor the scholarly interests to do the work. About 35 or 40 per cent of the entering Freshmen each year drop out before the beginning of the sophomore year. With a freshman class of 3,000 students, which some of our state universities now receive, this means a shrinkage of 1,000 to 1,200 in the first year. It would seem that the distribution of a large part of these underclassmen among several smaller institutions would both somewhat reduce the mortality of Freshmen and relieve the university of this great burden of teaching impossible Freshmen.

THE STATE UNIVERSITY

With this preliminary discussion let us consider what should properly constitute a great state university and what proportion of its students could be instructed advantageously in state junior colleges.

A study of the enrolment in the various departments of some eight or ten of our greatest universities, public and private, suggests the following as a not improbable distribution of students.

A STATE UNIVERSITY

College or School	Total Enrolment	Senior College, Graduate, and Professional Schools	Junior College	Desirable Junior-College Enrolment at University	Junior-College Students Preferably Enrolled at Other Centers
Arts and sciences	2,500	900	1,600	800	800
Graduate school	500	500	....	....	....
Medicine	200	200	....	....	....
Law	200	200	....	....	....
Dentistry	200	200	....	....	....
Pharmacy	200	125	75	50	25
Engineering:					
Freshman	750	....	750	350	400
Civil	150	90	60	40	20
Mechanical	300	180	120	80	40
Electrical	200	125	75	50	25
Chemical	200	125	75	50	25
Mining	100	60	40	30	10
Sanitary	100	60	40	30	10
Agriculture	1,500	600	900	500	400
Veterinary medicine	150	150	....	....	....
Commerce and business	1,200	400	800	400	400
Education	1,000	300	700	300	400
Journalism	200	100	100	50	50
Library science	50	50	....	....	....
Landscape architecture	50	50	....	....	....
Architecture and design	150	150	....	....	....
Music	100	100	....	....	....
Total	10,000	4,665	5,335	2,730	2,605

Inasmuch as this must be only an approximation we might perhaps assume that an adequate state university system would enroll 10,000 students in its regular classes September to June of whom about 5,000 would be in the senior college, graduate, and professional schools and 5,000 in the junior college. And, further, that of these 5,000 in the junior college about half, or 2,500, could be advantageously instructed at the university while the remaining 2,500 could best be provided for in two or three junior colleges located in other parts of the state. This would mean a university of 10,000 enrolling 7,500 at the university and 2,500 at state junior colleges.

A study of the expenditures of the larger institutions seems to indicate that after the number of students in college passes 400 or 500, no further saving in operating costs results from increasing numbers. In other words, we may conclude that it is a matter of relative indifference as to cost whether the 10,000 students considered are instructed in one institution or in four. In fact, it is probable that excellent and thoroughly satisfactory instruction could be given to the 2,500 students in the junior colleges apart from the university at a somewhat lower figure than would be possible at the university.

The expenditures of the larger universities seem also to show that the total expenses are roughly twice the amount of the total salaries paid exclusively for teaching.

THE UNIVERSITY STAFF

With these two assumptions which I believe to be reasonably accurate let us consider the staff necessary for instruction.

A study of the curriculum of a number of typical courses points to 24 hours a week as the average time a junior-college student should be under instruction and 25 hours as the average for the senior-college and professional student.

If the work of the junior college both at the university and at the separate junior colleges is somewhat sharply differentiated from the advanced instruction and put in the hands of men who are primarily teachers, it seems reasonable to expect the men on this part of the staff to teach 300 student-hours a week.

On this basis, 5,000 students receiving 24 hours' instruction a week from instructors teaching 300 student-hours a week would require

$$\frac{5{,}000 \times 24}{300} = 400 \text{ instructors, or 1 instructor to 12.5 students.}$$

Assume this staff to be made up as follows:

25 men at $5,000	$125,000
50 men at 4,000	200,000
25 men at 3,500	87,500
175 men at 3,000	525,000
125 men at 2,000	250,000
Salaries of teaching staff of junior college	$1,187,500

In the senior college and professional schools it would seem that with careful organization and sympathetic co-operation an institution might be developed in which the maximum research would be done and at the same time the average teaching load would be 200 student-hours a week.

On this basis the 5,000 students in this part of the institution, each receiving 25 hours instruction a week from instructors teaching 200 student-hours a week, would require a staff of

$$\frac{5{,}000\times 25}{200}=625 \text{ men, or 1 instructor to 8 students.}$$

The following salary scale would seem reasonable to secure an able staff for this part of the institution.

25 men at	$10,000	$250,000
50 men at	7,500	375,000
50 men at	6,000	300,000
30 men at	5,000	150,000
200 men at	4,000	800,000
150 men at	3,000	450,000
120 men at	2,000	240,000
625 men at		$2,565,000

If these several institutions were under a proper organization, with sufficiently centralized control and intelligent supervision of teaching staff so that the peculiar capacity of each man was known and his best ability encouraged, it would seem possible to give all men having ability for research adequate opportunity, and also to provide sufficient teaching for good teachers who have relatively small ability for research, so that all could be paid good salaries.

With a total salary budget for instruction as developed above of	$3,752,500
we should probably allow for all other salaries and expenses	2,747,500
	$6,500,000

While this is less than 50 per cent of the total expense (42 per cent), the salaries of the instructors are higher than any institution pays at present.[1]

---

[1] For comparison, it may be noted that the expenditures other than for teachers' salaries were as follows for a few of our institutions:

1917–18 Columbia	$1,143,960	43.4 per cent
1918–19 Illinois	1,425,383	49.0 per cent
1918–19 Michigan	1,663,518	65.0 per cent
1916–17 Ohio State	1,098,886	64.0 per cent

On the above basis the expenditure would be $650 per year per student, $6,340 per year per instructor; or:

In the junior college	$ 420	per student
In the junior college	5,250	per instructor
In senior college and professional schools	880	per student
In senior college and professional schools	7,040	per instructor

It may be said that a university so large in enrolment or in variety of schools and courses is not needed in a state of small population as it is in a state of larger population. This may be true. On the other hand, Wisconsin and Michigan with approximately half the population of Illinois and Ohio are maintaining state universities of approximately the same size and offering about the same variety of opportunity.

With this in view I am suggesting that any state of two million or more population could profitably maintain a university such as is described above. As the population and wealth increased its per capita cost would decrease.

THE STATE UNIVERSITY PLANT

A study of the educational plants in Iowa in 1916 showed an average of about 250 square feet of college buildings per student, and an average cost of these buildings of about $3.00 per square foot. It would seem that the lowest possible estimate now would be $5.00 a square foot or about $1,250 per student.

This would involve an expenditure for an adequate plant, exclusive of land and all buildings other than those used for educational purposes, of $12,500,000.

If this were distributed between three junior colleges for 833 students each and a university for 7,500 students, the capital outlay for educational buildings each place would be

$1,050,000 for each junior college
$9,350,000 for the university

Educational buildings at

Michigan are valued at	$3,575,000
Illinois are valued at	4,042,000
Wisconsin are valued at	3,500,000
Ohio State are valued at	2,473,000

STATE NORMAL SCHOOLS

What provision a state should make for the training of teachers in the elementary schools is hard to determine. Two methods of approach are suggested:

1. What are the leading states now doing?
2. What provision is necessary to maintain an adequate staff of trained teachers?

The following table is prepared from the Commissioner's Report of 1917. The population given for 1910 is probably at least 10 per cent too small for 1920. The total enrolment given of "students in normal departments" must, at least in some cases, include summer-term enrolment or short-course students, as some of these figures seem extravagantly large. The average enrolment also seems too high for creditable work.

TABLE OF NORMAL SCHOOLS IN TEN STATES

State	Population in 1910	Number Normal Schools	Enrolment 1915–16	Graduates 1916	Enrolment per Million Population	Average Enrolment per School
New York	9,113,000	10	5,740	2,635	600	500
Illinois	5,638,000	5	9,441	862	1,800	1,900
Ohio	4,756,000	5	1,464	486	300	300
Missouri	3,292,000	5	5,625	1,009	1,100	1,100
Michigan	2,810,000	4	5,825	1,842	2,100	1,500
California	2,377,000	8	5,052	1,960	2,100	600
Wisconsin	2,333,000	8	6,957	2,064	2,500	800
Minnesota	2,075,000	5	3,922	729	1,200	800
Nebraska	1,191,000	4	2,170	391	1,800	500
Washington	1,141,000	3	2,412	595	2,100	800
Total			48,608	12,573		
Average					1,560	880

The percentage of enrolment graduated ranged from 9.1 in Illinois to 38.7 in California, with an average of 25.8.

The average enrolment per school is 880. This is certainly too high for the best work. It would seem that the enrolment of elementary teachers in one school should not exceed 500.

The average enrolment per million population is 1,560. But New York and Ohio are both exceptional states: New York because so large a percentage of her population is in New York City and the teachers for the city are trained there; Ohio because the state entered the field of training teachers only within the last few years.

If we except these two states, perhaps 1,800 students enrolled per million population would be a fairer number to take as the desirable figure to which practice points.

This matter can be approached from another angle. A very critical survey of the demand for teachers has recently been made in Ohio. With a present population of about 5,000,000, Ohio has now in service about 30,000 teachers in the elementary schools, or 6,000 per million. Of these about 20 per cent must be replaced annually, or about 1,200 new teachers per million population are needed annually. Approximately half of these should be supplied by city training schools and other agencies such as county normal schools, leaving 600 a year to be prepared by the state. If the 600 to be graduated each year make up 30 per cent of the enrolment, we should provide for an enrolment of 2,000 per million population.

This roughly checks the other figures and we may conclude that a state is adequately provided with normal schools that has three or four schools with a total enrolment of 1,800 to 2,000 for every million population.

The reasonable cost of maintaining and operating normal schools enrolling 2,000 students and graduating 600 annually may be estimated as follows:

Assuming 1 instructor, exclusive of critic teachers, to 15 students, 2,000 students would require 133 teachers.

Assuming that these are being trained in 4 schools we might secure an adequate staff on a salary scale for each school of:

$5,000 each for 5 professors	$25,000
4,000 each for 3 associate professors	12,000
3,000 each for 12 assistant professors	36,000
2,000 each for 13 instructors	26,000
1,800 each for 15 critic teachers[1]	27,000
Total	$126,000
Operating expenses	100,000
Total annual expenditures	$226,000
4 schools at this figure would cost	$904,000

or $\frac{900{,}000}{2{,}000}=\$450.00$ per student ($900,000 per million population).

---

[1] We assume that 1 critic teacher should be maintained for every 10 graduates, and that 600/4, or 150, will graduate from each school annually. Approximately $45,000 is allowed here for the practice school. This should certainly be partly supported by the local community whose children are educated or by tuition paid by pupils. The above estimate, however, makes no allowance for this reasonable source of support of the practice school.

NORMAL SCHOOL PLANTS

The plants for these schools, exclusive of dormitories, will probably cost close to $1,250 per student, $625,000 per school, or $2,500,000 per million population.

It is to be noted that in most cases the number of graduates is relatively far too small in proportion to the enrolment. If the entering students could be selected more carefully and if the capable students could be held the second year it certainly ought to be possible to graduate 600 Sophomores from 700 Freshmen. If this could be accomplished we could cut our enrolment from 2,000 to 1,300 and our schools from four to three, or possibly two.

It would cost for 1,300 students at the rate of $450 per student $585,000 as against $900,000 for 2,000—a saving of $315,000.

Much has been said about the obligation of the state to pay students to attend teacher-training schools. If the right type of high-school graduate could be enrolled in the first place and if 600 of the entering 700 could be retained the second year in the school, each Sophomore could be paid $400 for maintenance and the state could still save money over what is being done at present when 30 per cent or less are graduated.

TOTAL COST OF HIGHER EDUCATION TO THE STATE

Assume that states with populations of from two to five million population provide universities and normal schools on the scale set forth, what would it cost?

Population.......	2,000,000	3,000,000	4,000,000	5,000,000
Cost of university.	$6,500,000	$6,500,000	$6,500,000	$6,500,000
Normal schools....	$1,800,000	$2,750,000	$3,600,000	$4,500,000
Total cost....	$8,300,000	$9,250,000	$10,100,000	$11,000,000
Cost per capita.	$4.15	$3.08	$2.52	$2.20
Cost per $1,000 wealth[1].......	$2.08	$1.54	$1.26	$1.10

or a tax of from 1 to 2 mills would yield the necessary funds.

The above figures do not take into consideration any receipts. It would certainly seem reasonable to expect the fees and other charges to students to yield from 10 to 20 per cent of the total cost.

---

[1] This last figure is based on the estimate that the wealth in the United States averages $2,000 per capita. The wealth of the United States was given by the Census Bureau in 1912 as $187,000,000,000. An unofficial estimate for 1917 was $220,000,000,000. It seems probable that for 1920 with 110,000,000 population we must have at least $250,000,000,000, or a per capita of $2,270.

A question may be raised as to what number of students the state should look forward to providing with instruction. The preceding figures would provide for 20,000 in a state of 5,000,000. In Ohio it is now quite apparent that within ten years there will be close to 40,000 students in the institutions of higher learning. At present about 16,000 are in higher institutions outside those supported by the state and 9,000 are in state-supported institutions. Of these latter, however, only about 1,500 are enrolled in the state normal schools. With these facts in view it does not seem improbable that Ohio will before many decades be called on to provide for 20,000 students in her state educational institutions.

Education heretofore has been academic, for the few, usually the poor, many of whom went into the church. It has been a charity. It has been humbly administered and we have been proud of large results from small unpromising means.

Today this is largely changed. Tomorrow there is a promise that in this country many will wish an education who now do not desire it. It is more and more becoming a practical means to an end. It means, more and more, larger income, bigger service, finer men and women. More is expected; much more must be spent.

If this paper arouses some thought on the magnitude of the educational problem before us, it will have served its purpose.